device or method to harness a portion of the energy involved in the normal use of the electronic device.

7. Alternative Embodiments

[0047] The user interface system of an alternative embodiment of the invention omits the display **150**. The user interface system of the alternative embodiment is otherwise similar or identical to the user interface system **100** of the preferred embodiment. The user interface system of the alternative embodiment can be incorporated into electronic devices that do not typically include a display, such as peripheral for an electronic device. Suitable peripherals include a mouse, a trackpad, a keyboard, and a remote control. These peripherals are often used only by touch, and not by sight. The user interface system may, however, be incorporated in any suitable device.

[0048] As a person skilled in the art of user interfaces will recognize from the previous detailed description and from the figures and claims, modifications and changes can be made to the preferred embodiments of the invention without departing from the scope of this invention defined in the following claims.

We claim:

1. A user interface comprising:

a substrate comprising an attachment face and a support member continuous with the attachment face, the substrate defining a fluid channel configured to communicate fluid through the support member;

a tactile layer comprising an outer tactile surface and a back surface opposite the tactile surface, the back surface of an undeformable region of the tactile layer coupled to the attachment face, and the back surface of a deformable region of the tactile layer adjacent to and disconnected from the support member, wherein the deformable region is of a thickness at least as great as a width dimension of the fluid channel adjacent to the back surface, and wherein the support member is configured to support the deformable region against inward deformation;

a displacement device configured to displace fluid through the fluid channel and toward the back surface of the deformable region to transition the deformable region from a retracted setting to an expanded setting tactilely distinguishable from the retracted setting at the tactile surface; and

a sensor coupled to the substrate and configured to detect an input at the tactile surface.

2. The user interface of claim **1**, wherein the attachment face and the support member define a continuous curved surface.

3. The user interface of claim **1**, wherein the attachment face and the support member are planar.

4. The user interface of claim **1**, wherein the deformable and undeformable regions of the tactile layer are adjacent and of substantially similar thicknesses.

5. The user interface of claim **1**, wherein, in the retracted setting, the tactile surface of the deformable region is flush with the tactile surface of the undeformable region.

6. The user interface of claim **5**, wherein, in the expanded setting, the tactile surface of the deformable region is elevated above a portion of the tactile surface of the undeformable region.

7. The user interface of claim **6**, wherein, in the expanded setting, the tactile surface of the deformable region defines one of: a button, a ridge, a ring, a slider, and a pointing stick.

8. The user interface of claim **1**, wherein, in the retracted setting, the back surface of the deformable region is in contact with the support member.

9. The user interface of claim **8**, wherein, in the expanded setting, the back surface of the deformable region is lifted off of the support member.

10. The user interface of claim **1**, wherein the fluid channel is substantially circular in cross-section at the support member, and wherein the thickness of the deformable region of the tactile layer is approximately the diameter of the fluid channel at the support member adjacent the back surface.

11. The user interface of claim **1**, further comprising a reservoir coupled to the displacement device and configured to contain fluid.

12. The user interface of claim **1**, further comprising a valve arranged between the fluid channel and the displacement device.

13. The user interface of claim **1**, wherein the sensor is a capacitive touch sensor.

14. The user interface of claim **1**, further comprising a display coupled to the substrate and configured to visually output an image through the tactile surface.

15. The user interface of claim **14**, wherein the display is configured to output the image that is an input key substantially aligned with the deformable region.

16. The user interface of claim **1**, wherein the substrate further defines a fluid channel configured to communicate fluid between the displacement device and the fluid channel.

17. The user interface of claim **1**, wherein the displacement device is a pump.

18. The user interface of claim **1**, wherein the displacement device is further configured to displace fluid away from the back surface of the deformable region to transition the deformable region from the expanded setting to the retracted setting.

19. The user interface of claim **1**, further comprising a processor coupled to the sensor and configured to interpret an input that that is a touch on the tactile surface of the deformable region as:

a first input type when the deformable region is in the retracted setting; and

a second input type when the deformable region is in the expanded setting.

20. The user interface of claim **1**, wherein the substrate further comprises a second support member continuous with the attachment face, the substrate further defining a second fluid channel configured to communicate fluid through the second support member, wherein the back surface of the tactile layer is adjacent to and disconnected from the second support member at a second deformable region of the tactile layer, wherein the support member limits inward deformation of the second deformable region, and wherein the displacement device is further configured to displace fluid, through the second fluid channel, toward the back surface of the second deformable region to transition the second deformable region from a retracted setting to an expanded, wherein the expanded setting is tactilely distinguishable from the retracted setting at the second deformable region of the tactile surface.